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FEDERAL COMMUNICATIONS COMMISSION
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**REPLY COMMENTS OF
METRICOM, INC.**

3. Loral/Qualcomm Partnership, L.P. suggests that the Commission allocate the 2402-2417 MHz band for satellite downlinks. The Wireless Cable Association International, Inc. ("WCAI") wants to use this band to provide its members with the return paths for "emerging" interactive applications that are not currently

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proven. The Los Angeles County Sheriff's Department wants the FCC to furnish it with "two to four 6 MHz wide video channel[s]" in the 2.4 GHz band. Metricom opposes the introduction of such additional licensed services into this band.

4. The FCC itself has stated: "[i]t will be extremely difficult to provide a licensed service in this band because of its heavy use by ISM equipment."^{1/} Proposed microwave lighting systems and microwave ovens emit substantial energy throughout the 2.4 GHz band notwithstanding that these emissions peak at 2450 MHz.^{2/} New licensed services, as contemplated by Loral/Qualcomm, WCAI and the

^{1/}Report from the Federal Communications Commission to Ronald H. Brown Secretary, U.S. Department of Commerce Regarding the Preliminary Spectrum Reallocation Report, FCC 94-213, released August 9, 1994, at para 39 and 51. ("Report") See, also, Comments of International Business Machines Corporation at p. 12.

^{2/} Report at para. 38.

See, also, Comments of Microsoft Corporation at p.4: "Microwave ovens are the predominate user of the 2.4 GHz band, producing a high ambient noise level in the band. With deployment of Part 15 frequency hopping transmitters, the ambient noise level will get higher. This suggests that any commercial services operating in the proposed reallocation at 2402-2417 MHz must use high power transmitting equipment to overcome noisy radio conditions. High power means higher cost equipment and potential adverse health effects. Further, high power operation in this segment of the band will adversely impact Part 15 receivers in the adjoining Part 15 segments through receiver overload and desensitization and intermodulation products."

See, also, Comments of Apple Computer, Inc. n.15: "In addition, there is every prospect of yet another interference-contributing source in the 2400 MHz band: microwave lighting. High power lighting devices that use magnetrons show similar... wave characteristics to ovens; that is, they nominally are centered in the ISM band and occupy tens of MHz instantaneously and more during longer periods, and as they age, they tend to drift lower in frequency and emit more signals into their surroundings. The deployment of these devices will require greater ISM/Part 15 spectrum to enable communications devices to avoid these additional interference sources."

See, also, Comments of Fusion Systems Corporation.

Los Angeles County Sheriff would experience significant interference and would also cause greater interference to other users in the band.^{3/} The 2402-2417 MHz band is simply not suited to the addition of new licensed services and the cost to the public resulting from the potential loss of services provided by Part 15 devices^{4/} would be far greater than any gain the Commission could hope to achieve as a result of revenues generated from auctioning this spectrum.^{5/}

^{3/}"Even the few comments that suggest using the 2402-2417 MHz band for other services note the difficulty that will be involved in overcoming the interference concerns. 39/ Not one of these comments proposes a use for this spectrum for which technology to overcome this interference is actually available. For example, APCO's suggestion that the spectrum be used for private mobile communications services is feasible only 'assuming that methods are developed to alleviate problems posed by continuing use' of the band.40/ Similarly, Loral/Qualcomm admitted that it had not yet tested the full effect of interference on mobile satellite services and later reversed its position and affirmed that the 2402-2417 MHz band was not usable for such services.41/ UTI suggests that the band 'might provide suitable spectrum for ... systems which are able to ... tolerate potential interference.'41/

Such tenuous and unsubstantiated showings cannot support the Commission's obligation to determine that a reallocation will 'promote public convenience or interest or will serve public necessity.'43/" Comments of International Business Machines Corporation at p.13-14.

^{4/}See Comments of the Part 15 Coalition at P. 5, "Adding Licensed Services to The 2402-2417 MHz Band Would Render The Band Unusable for Part 15 Technologies," for a discussion of this point. Metricom is a member of the Part 15 Coalition and endorses the views expressed by the Part 15 Coalition in its Comments and in its Reply Comments.

^{5/}"While reallocating the band to licensed uses may result in revenues for the Federal Government, the lack of support for these uses in the comments indicates that even this premise is highly questionable. In any event, Congress has clearly stated that 'the Commission may not base a finding of public interest, convenience and necessity on the expectation of Federal revenues.'45/" Comments of International Business Machines Corporation at p. 15. See, also,
(continued...)

5. Metricom agrees with the Commission and the vast majority of those filing comments^{6/} in this proceeding that spread spectrum Part 15 operations are the best and most valued use of the 2402-2417 MHz band. The Commission's proposal^{7/} gravely threatens the thriving and competitive Part 15 industry that has developed (and is continuing to develop), pursuant to FCC encouragement^{8/}, spread spectrum short-range communications systems for a variety of needs that touch the lives of virtually every American on a daily basis.^{9/}

6. A not-so-obvious example of an investment for Part 15 use of this band now at risk under the current proposal is the work of IEEE committee 802.11 which has been meeting for several years to establish an industry standard for Part 15 wireless LAN units operating at 2.4 GHz. Many of this countries' outstanding

^{5/}(...continued)
Comments of The Wireless Information Networks Forum, Inc. at p. 6: "The proposed reliance on competitive bidding to allocate spectrum to specific services exceeds the Commission's auction authority."

^{6/} Supra n. 1 at 23 and, for example, Comments of Motorola, Inc. at p.10 et seq.; Comments of the Part 15 Coalition; Comments of International Business Machines Corporation at p.15 "III. Allocating the 2402-2417 MHz band to its incumbent uses, including Part 15 devices, is most consistent with Congress' mandate and the public interest."

^{7/} Notice of Proposed Rulemaking, ET Docket No. 94-32, FCC 94-272 (rel. Nov. 8, 1994) at paras. 9 and 18.

^{8/} Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, ET Docket No. 94124, Notice of Proposed Rulemaking, FCC 94-273, (rel. Nov. 8, 1994) at para 7.

^{9/}See Comments of The Consumer Electronics Group of the Electronic Industries Association at p. 3 et seq. "Part 15 devices have become essential to U.S. consumers and businesses."

communications and computing companies are a part of this industry standard setting committee: Motorola, IBM, Advanced Micro Devices, Apple Computer, Inc., AT&T Global Information Solutions, Digital Equipment Corp., GEC Plessey Semiconductors, Harris Corporation and many others. If Part 15 devices are no longer allowed to use the 2402-2417 MHz band, or if the anticipated operating environment of this band is altered, even in the slightest, years of work by this IEEE committee will be undone and wasted.^{10/}

7. A more obvious example of an investment for Part 15 use of this band now at risk under the Commission's proposal is the \$2 billion invested by the Part 15 community.^{11/} The Commission cannot ignore an investment of this magnitude in making its decisions regarding the 2402-2417 MHz band.

8. Another of Metricom's major concerns is that auctioning of the 2402-2417 MHz band to primary licensees will make the band extremely inhospitable to spread spectrum devices. This will occur not only because new primary licensees could cause interference to Part 15 devices, but also because new primary licensees might receive interference from spread spectrum operations and demand that such devices cease operations.^{12/}

^{10/}See Comments of IEEE 802, the LAN MAN Standards Committee and Comments of Standard Microsystems Corporation.

^{11/}Comments of The Part 15 Coalition at p.6.

^{12/}Metricom is also vehemently opposed to auctioning the 2402-2417 MHz band for unlicensed use. Such an auction would clearly be in contravention of the enabling legislation which permits the FCC to use auctions to award licenses. The Report to Accompany the Omnibus Reconciliation Act of 1993 states: "competitive bidding (continued...)"

9. If Part 15 devices are no longer allowed to use the 2402-2417 MHz band, the usable portion of the 2.4 GHz ISM band will be reduced to less than 75 MHz for Part 15 spread spectrum devices which is the minimum necessary for those devices under the scope of the IEEE committee in order to comply with FCC rules. The obvious FCC response to this problem is to alter the Part 15 spread spectrum rules to accommodate this reduction in spectrum; such a move by the FCC would doom the current 802.11 standards setting process (the draft of which is currently out for ballot).

10. The Commission must also be mindful that when combined with the U.S. market, other countries have (in making the 2.4 GHz band available for spread spectrum devices) created a substantial market opportunity for spread spectrum communications products. This becomes all the more significant when one considers that the Part 15 spread spectrum industry is primarily an American industry, using American technology and creating many American jobs and wealth for American investors and entrepreneurs.^{13/}

^{12/}(...continued)
would not be permitted to be used for unlicensed services." H.R. Rep. No. 103-11 at 253. See, also, Implementation of Section 309(j) of the Communications Act- Competitive Bidding, Second Report and Order, 9 FCC Rcd 2348, 2358 & n. 50 (1994) where the Commission declined to auction spectrum for unlicensed PCS services on this rationale.

^{13/} "For example, the European administrations have agreed on a recommendation for similar usage of the 2.4 GHz band. This recommendation has already been implemented by Austria, Belgium, Bulgaria, Denmark, Finland, Germany, Ireland, Liechtenstein, Norway, Switzerland, and Turkey. The recommendation is also under active consideration by Iceland, the Netherlands, Sweden, the United Kingdom, Croatia, France, Greece, Italy and Poland." Comments of Motorola, Inc. at p 12-13. See, also, Comments of The Part 15 Coalition at p. 7.

11. In conclusion, Metricom urges the Commission to retain Part 15 spread spectrum use of the 2402-2417 MHz band and not to introduce, by auction or otherwise, any additional licensed services into this band.

Respectfully submitted,

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